CLAIMS:

1. An objective lens (105,305,405) for use with a multi-layer optical information carrier (110,310,410) having at least a first information, top, layer at a depth D1 below an entrance surface of the carrier and a second, bottom, information layer at a depth D2, greater than depth D1, characterized in that the objective lens (105,305,405) is optimized to produce substantially equal amounts of higher order spherical wavefront aberration when reading the first and second information layers by designing said objective lens to provide minimum spherical aberration for scanning at a depth D_{opt} which is located between an average layer depth $D_{AV} = ((D1 + D2)/2)$ and a depth $(D1 + D_{AV})/2$.

2. The objective lens of claim 1, wherein the objective lens (105,305,405) is optimized to produce substantially equal amounts of higher order spherical wavefront aberration when reading the first and second information layers by designing said objective lens to provide minimum spherical aberration for scanning at a depth D_{opt} which is less than $0.995\ D_{AV}$.

3. The objective lens of claim 1, wherein the objective lens (105,305,405) is optimized to produce substantially equal amounts of higher order spherical wavefront aberration when scanning the first and second information layers by designing said objective lens to provide minimum spherical aberration for scanning at a depth D_{opt} which is less than $0.99\ D_{AV}$.

4. The objective lens of any of claims 1 to 3, wherein the objective lens (105,305,405) is arranged, in use, such that when scanning the first information layer a radiation beam from a light source (101) is convergent on entry to the objective lens (105,305,405), whilst when scanning the second information layer the radiation beam is divergent on entry.

5. An optical scanning device for optically scanning a multi-layer optical information carrier (110) having at least a first, top, information layer (111) at a depth D1

below an entrance surface of the carrier and a second, bottom, information layer (112) at a depth D2, greater than depth D1, characterized in that an objective lens (105,305,405) of said device is optimized to produce substantially equal amounts of higher order spherical wavefront aberration when scanning the first and second information layers by designing said objective lens (105,305,405) to provide minimum spherical aberration for scanning at a depth D_{opt} which is located between an average layer depth $D_{AV} = ((D1 + D2)/2)$ and a depth $(D1 + D_{AV})/2$.

6. The device of claim 5, wherein the objective lens (105,305,405) is optimized to produce substantially equal amounts of higher order spherical aberration when scanning the first and second information layers by designing said objective lens (105,305,405) to provide minimum spherical aberration for scanning a layer at a depth D_{opt} which is less than $0.995\ D_{AV}$.

7. The device of claim 5, wherein the objective lens (105,305,405) is optimized to produce substantially equal amounts of higher order spherical aberration when scanning the first and second information layers by designing said objective lens to provide minimum spherical aberration for scanning at a depth D_{opt} which is less than $0.99\ D_{AV}$.

8. The device of any of claims 5 to 7, wherein the device further comprises a light source (101) , a collimator type lens (103), a beam splitter (104) , and a controller (108), wherein the light source (101) is arranged to emit a light beamthrough the collimator type lens (103) and focused by the objective lens (105) to selectively be incident upon the first or second information layer according to a position of the collimator type lens(103) relative to the objective lens (105) as controlled by the controller (108), wherein reflected light from the information carrier (110) is received by the beam splitter (104) and transmitted to the photodetector (106).

9. The device of claim 8, wherein when scanning the first information layer (111), the collimator type lens(103) is arranged to convert the radiation beam (102) into a beam which is converging on entry to the objective lens (105), whilst when scanning the second information layer (112), the collimator type lens is arranged to convert the radiation beam into a beam which is diverging on entry to the objective lens (105).

10. The objective lens of any of claims 1 to 4 or the optical scanning device of any of claims 5 to 9, wherein the multi-layer information carrier is a Blu-ray type disk.